March 25, 2004

MEMORANDUM TO: Joseph G. Giitter, Chief
Special Projects Branch
Division of Fuel Cycle Safety
and Safeguards

THRU: Brian W. Smith, Chief /RA/
Gas Centrifuge Facility Licensing Section
Special Projects Branch, FCSS

FROM: Timothy C. Johnson /RA/
Senior Mechanical Systems Engineer
Gas Centrifuge Facility Licensing Section
Special Projects Branch, FCSS

SUBJECT: MARCH 9-10, 2004, MEETING SUMMARY: LOUISIANA ENERGY SERVICES' INTEGRATED SAFETY ANALYSIS IN-OFFICE REVIEW

On March 9 - 10, 2004, U.S. Nuclear Regulatory Commission (NRC) staff met with Framatome staff to discuss the Integrated Safety Analysis documentation for the Louisiana Energy Services (LES) gas centrifuge uranium enrichment plant project proposed to be located in Eunice, New Mexico. I am attaching the meeting summary for your use. This summary contains no proprietary or classified information.

Docket: 70-3103

Attachment: Louisiana Energy Services
Meeting Summary

cc: William Szymanski/DOE
Rod Krich/Exelon
James Curtiss/W&S
Peter Miner/USEC
James Ferland/LES
Dennis Holmberg/Lea County
James Brown/Eunice
Michael Marriotte/NIRS
CO'Claire/Ohio
Derrith Watchman-Moore/NM
Claydean Claiborne/Jal
Monty Newman/Hobbs
Troy Harris/Lovington
Betty Richman/Tatum
Glen Hackler/Andrews
William Floyd/New Mexico
Richard Ratliff/Texas
Jerry Clift/Hartsville
Lee Cheney/CNIC

Summary of Meeting with
Louisiana Energy Services on Integrated Safety Analysis

Dates: March 9 - 10, 2004

Place: Framatome offices
Marlborough, MA

Attendees:

D. Brown/NRC	H. Felsher/NRC
T.C. Johnson/NRC	J. Klein/NRC
W. Troskoski/NRC	R. Wescott/NRC
D. Green/Excel	G. Harper/Framatome
M. Kennedy/Framatome	D. Pepe/Framatome

Purpose:

The purpose of this meeting was to review and discuss the unclassified backup documentation prepared for the Louisiana Energy Services (LES) Integrated Safety Analysis (ISA) for its gas centrifuge uranium enrichment plant proposed to be located in Eunice, New Mexico. Framatome is the LES contractor responsible for coordinating the unclassified ISA preparation.

Discussion:

After introductions, Mr. M. Kennedy discussed the general approach LES had taken to prepare its ISA for its proposed gas centrifuge plant in New Mexico (see Attachment 1). LES used a HAZOP process as the ISA Method for all safety disciplines, fire, and external events. He also explained the documentation used for the project and how it related to the application documentation that had been previously prepared for the Hartsville, Tennessee, site. All documentation for the Hartsville site was reviewed to assess what changes would be needed for it to be used for the Eunice site. Documentation on the review process was prepared showing which documents required or did not require changes.

M. Kennedy explained the status of the facility design. He stated that equipment functions are known and described in the application. Process and instrumentation diagrams (P&IDs) are also not expected to change. However, since procurement has not started, details on equipment manufacturer, models, final dimensions, etc., have not yet been determined for final design.

Staff reviewed detailed documentation and calculations in the following areas:

Uranium and hydrogen fluoride (HF) consequence assessment limits;
Criticality safety;
Airborne releases from buildings and the evaporation basin;
Hazardous and mixed waste generation;
Gaseous effluent ventilation system;
Fire safety;
Emergency response.

The staff conducted a vertical slice review of the Blending and Sampling System. This system was chosen based on greatest relative risk posed by uranium hexafluoride (UF_6) in the liquid state. Topics covered during the review included the design update review, system node

breakdown, HAZOP tables, accident sequence descriptions, action item lists, an integrated review of other site areas that could affect the system, P&IDs, criticality safety assessments, system descriptions, bounding calculations, fire, and flooding effects.

The staff also reviewed the ISA Consequence Assessment for Airborne Releases, which contained appropriate information related to the performance of the consequence assessments, UF_6 source terms, atmospheric dispersion factors, and leak flow path rates for each scenario. The methods and assumptions were extensively based on Regulatory Guide 1.145, "Atmospheric Dispersion Models for Potential Accident Consequence Assessments at Nuclear Power Plants."

Other ISA documents included in the staff's review were the Chemical Inventory/Hazards List, Natural Gas Pipeline Hazard Risk Determination, and the Product Take-Off System HAZOP and Risk Determination Analysis. The information in the ISA documents appeared to be of appropriate detail for the complexity of the gas centrifuge process and addressed radiological hazards, chemical hazards, facility hazards, potential accident sequences, the consequences and likelihood of occurrence, and items relied on for safety (IROFS). The natural gas hazard evaluation considered over-pressure on plant structures from potential shock waves, missile impact from an air burst detonation and radiant heat flux. The staff noted that the distance from the natural gas pipeline to the plant would exceed the calculated safe distance by a substantial margin.

The staff also conducted discussions with the applicant concerning the proposed quantitative standards for determining the performance criteria specified in 10 CFR 70.61. The proposed values for HF and UO_2F_2, contained in Table 6.3-5, Enhanced Definition of Consequence Severity Categories, were extrapolated from the Acute Exposure Guideline Levels (AEGL) values in effect at the time of the license application submittal. NUREG-1520, Section 6.4.3.1, Process Chemical Risk and Accident Sequences, notes that acute chemical release limits may not be adjusted by a time-weighted average calculation unless a rational basis is provided in the ISA Summary. The applicant stated that the revised AEGL values for HF and UF_6 (which reacts with water in the atmosphere to produce HF and UO_2F_2) and the time-weighted average approach contained in the National Academy of Sciences latest revision to the AEGLs (2004) would be used in determining the consequence levels. LES will provide updated information to reflect the latest information.

Documentation of chemically hazardous and mixed chemical and radioactive waste generation were reviewed. LES is preparing a Resource, Conservation, and Recovery Act (RCRA) small generator permit application. Under this application, chemically hazardous and mixed wastes cannot be stored on-site for more than 90 days. NRC staff was concerned that all chemically hazardous and mixed waste have a reasonable assurance of being properly treated and disposed of. The LES generation estimates are based on experience for similar facilities at the Urenco facilities in Europe. Mixed wastes are expected with the U.S. Environmental Protection Agency RCRA hazardous chemical designations D001, D002, D003, F001, F003, and F005. Information was also provided on potential treatment and disposal services for mixed wastes that are properly permitted by the U.S. Environmental Protection Agency or its authorized States and licensed under NRC or its Agreement State requirements (see Attachment 2). Five facilities were identified as possible treatment and disposal options for these wastes. This information satisfied NRC staff's concerns in this area.

Staff reviewed the determination of aircraft hazards and the margin in these calculations for potential growth in flights from the Eunice airport, the nearest airport to the proposed site, 15 miles away. The aircraft hazard analysis used methods based on NRC guidance in NUREG-1520, “Standard Review Plan for the Review of a License Application for a Fuel Cycle Facility.” Based on Federal Aviation Administration data, about 480 flights per year use the Eunice airport. Based on NUREG-1520, 22,500 flights per year would be needed to trigger more detailed review of accident hazards at the facility from local flight activity. Therefore, there appears to be sufficient margin in the number of flights to allow for possible future growth in flight activity at the Eunice airport.

Staff reviewed the Hazard and Risk Determination Analyses and the four bounding documents that were used as part of the ISA process for nuclear criticality safety, which were:

- "Criticality Safety Assessment for the Main Separation Plant," UPD/0200530 (11/12/03);
- "Criticality Safety Evaluation of Evacuating an Assay Unit into a Single Tails Cylinder," UPD/0202631 (11/05/02);
- "Preliminary Criticality Safety Assessment for the LES-2 Technical Services Building (TSB)," UPD/0202783 (10/31/02); and
- "Determination of Critical and Safe Parameters of Generic Uranyl Fluoride Systems of 5% and 6% U-235 Enrichment," UPD/9903096

In addition to the four documents reviewed above and additional documents provided by Framatome, and discussions with applicant personnel, LES contractor staff understands NRC's nuclear criticality safety regulatory requirements better and NRC understands LES' approach for nuclear criticality safety better.

In the areas of radiological protection, emergency planning, and decommissioning, staff reviewed the following documents and calculations:

- “Gaseous Effluent Ventilation System HAZOP and Risk Determination Analysis”
- “Contamination Workshop and Decontamination System HAZOP and Risk Determination Analysis;”
- “Chemical Laboratory System HAZOP and Risk Determination Analysis”;
- “ISA Consequence Assessments for Airborne Releases;”
- “Potential Doses Due to Effluent Discharges from the NEF, New Mexico Site Exfiltration Estimate;” and
- “Liquid Effluent Collection and Treatment System Estimated Uranic Discharge Treated Effluent Evaporative Basin.”

The staff reviewed the ISA Consequence Assessment for Airborne Releases, which included the applicant’s approach and assumptions for calculations of both on-site and off-site radiological and chemical concentrations and exposures. The approach and assumptions were found to be conservative and based largely on NRC regulations. In particular, staff reviewed backup documentation on airborne releases from exfiltration of buildings. These calculations were based on American Society of Heating, Refrigerating, and Air Conditioning Engineers methods for determining leakage from buildings under various pressure difference scenarios. LES calculations considered conservative pressure differentials caused by wind effects and computed air leakage from buildings containing radioactive materials. These computations have a reasonable basis and use standard calculation methods.

In the environmental area, staff reviewed several calculations, including:

- "ISA Consequence Assessments for Airborne Releases," 32-2400503-0;
- "LES-2 Building Volumes and Profiles," 32-2400504-0;
- "LES-2 UF_6 Release Estimates," 32-2400505-0;
- "Potential Doses Due to Effluent Discharges from the NEF, New Mexico Site," 32-2400513-00;
- "Exfiltration Estimate," L4-50-01-CALC;
- "Conceptual Calculation: Liquid Effluent Collection and Treatment System Estimated Uranic Discharge," L4-53-45-CALC; and
- "Calculation: Treated Effluent Evaporative Basin," L4-53-56-CALC

After reviewing "ISA Consequence Assessments for Airborne Releases," staff requested be submitted to NRC specific sections of the calculation that included: (1) a detailed description of the chemical and radiological consequence assessment method used by LES; and (2) a summary of source terms for various areas throughout the plant. At the close of the review, Framatome staff agreed to seek LES approval to grant staff's request.

During review of "Calculation: Treated Effluent Evaporative Basin," staff compared data for local evaporation rates (in inches per year) and Treated Effluent Evaporative Basin (TEEB) surface area (in square feet), each of which were design parameters for the TEEB. A preliminary calculation by staff indicates that the volume of evaporated water would exceed the volume of treated and untreated wastewater normally discharged into the basin. As a result, staff are concerned that LES' s assumption that the TEEB would be dry 10 percent of the time is probably too low. Staff will continue to evaluate the source term for fugitive emissions from the TEEB.

The fire protection review consisted of a review of general facility fire protection information and specific calculations performed by the applicant to support some of the safety evaluations of postulated fire scenarios. The general facility fire protection documents reviewed were:

- "Fire Hazards Analysis for License Application", L4-50-01-FHA; and
- "Assessment of Facility Fire Risk at NEF for ISA and Design Basis", 51-2400-00.

The first document, "Fire Hazards Analysis for License Application," provided a brief qualitative analysis of fire potential in areas containing UF_6 and listed flammable and combustible hazards and if a self-sustaining fire was credible. The potential for flashover was also evaluated for these various areas. Significant information obtained from these area evaluations was a listing of expected combustibles in these various areas and the primary means of fire protection. The document calls for most of the areas to be analyzed further for combustible loading controls or other measures when the design is finalized. The document also describes the fire protection water supply as capable of supplying a demand flow of 1000 gallons per minute for 2 hours with 100 percent redundancy. A staff concern that arose from the review was the need for an evaluation of the likelihood and consequences of a hydrogen explosion in the Chemical and Environmental Laboratories.

The second document, "Assessment of Facility Fire Risk at NEF for ISA and Design Basis," provided justification for the fire initiation index of -2 (no fires in combined Urenco facility experience of 30 years). The document also stated that worker training and orientation are being credited with the high reliability being assigned to administrative fire controls. The

document also referenced calculations for determining service vehicle fire effects on the Uranium Byproduct Cylinder (UBC) storage pad, vegetation fire on the UBC fire pad, Cylinder Receipt and Dispatch Building (CRDB) Truck Bay fire, and the 74 gallon transporter fuel limit identified in IROFS 36. "Safety Evaluation Report for the Claiborne Enrichment Center, Homer, Louisiana," NUREG-1491, was cited as the source of the 74 gallon fuel limit requirement. The analysis cited in NUREG-1491 was performed by the NRC staff for the proposed enrichment plant in Homer, Louisiana. In addition, the document identified battery charging areas as requiring additional evaluation for hydrogen explosion potential.

Staff also reviewed the following fire safety calculations:

- "CRDB Truck Bay Fire," 32-2400519-00;
- "Vegetation Fire Effects on UBC Pad," 32-2400518-00; and
- "Service Vehicle Fire Effects on UBC Pad," 32-2400517.

All the above calculations were performed to determine the integrity of UF_6 cylinders under various potential fire conditions. The CRDB Truck Bay Fire calculation assumed a heat source from a 500 liter pool of diesel fuel confined by the geometry of the truck bay into a 5 meter diameter pool. The critical temperature of the UF_6 which would result in cylinder failure was assumed to be 650° C as determined from test results. Radiant energy release from the hydrocarbon fuel fire was calculated using techniques from the SFPE Handbook for Fire Protection Engineering for hydrocarbon pool fires and applied to the cylinder. The cylinder temperature was determined using standard heat transfer calculations considering the cylinder location, steel mass of the cylinder, and duration of the fire. At a distance of 1.0 meter from the truck bay, the cylinder was determined to reach a temperature less than the critical temperature. The vegetation fire calculation postulated a large vegetation fire at the tree line approximately 89 meters from the UBC pad. The assumed temperature of the fire was 1005°C and the Stefan-Boltzman equation was used to calculate radiant energy heat transfer. Maximum resulting temperatures of a 30B and 48Y cylinders were determined to be below the critical temperature. The staff considered this calculation to be reasonable and appropriate. The service vehicle fire was also based on a pool containing 500 liters of diesel fuel. The pool was assumed to be the width of the access road and was 9.14 meters from the edge of the UBC. The fire temperature was assumed to be 1026°C and the Stefan-Boltzman equation was used to calculate radiant energy heat transfer. The resulting temperature of the cylinder was calculated to be below the critical temperature. The staff considered all the above calculations to be reasonable and appropriate for the postulated fire scenario.

Action Items:

None.

Attachments:

1. Framatome meeting handouts
2. EPA list of currently operating mixed waste facilities

ATTACHMENT 1

NRC Review of National Enrichment Facility Integrated Safety Analysis Documentation

March 9-11, 2004

Overview of Integrated Safety Analysis (ISA) Documentation

- ISA Documentation Includes
  - Process Safety Information
  - ISA Team Meeting Results
  - Action Items and Resolutions
  - Calculations
  - ISA Technical Reports
  - A/E and Urenco Documentation
  - IROFS Information
- Refer to Handout

Features of ISA Documentation

- Development started September 2002
- Hartsville, TN Site
- Updated to Reflect Lea County, NM Site
  - Utilized ISA Update Process (previously described at Feb. 26, 2004 Meeting)
  - Utilized Hartsville HAZOPS as a starting point
  - Utilized Hartsville Consequence Methodology and Selected Action Item Responses

Features of ISA Documentation (continued)

- Developed Lea County, NM specific documentation
  - HAZOPS
  - Consequence Evaluations
  - Accident Sequences and Risk Determinations
    - Internal and External Events

ATTACHMENT 2

Programs Home
Mixed Waste Home

About Mixed Waste
Common Questions
Mixed Waste Library
Laws & Regulations
Preventing and Managing Mixed Waste
EPA's Mixed Waste Team
Links

Currently Operating Mixed Waste TSDFs

The following treatment, storage, or disposal facilities (TSDF's) (listed alphabetically) currently have commercially available mixed waste treatment, storage, and/or disposal capabilities.

This page is not to be consider as an endorsement or recommendation for use. The following companies listed on this page represent only those permitted mixed waste treatment, storage, and/or disposal facilities currently accepting commercial mixed waste that have expressed an interest in participating in this HomePage. Generators should contact facilities operators and State and/or Federal regulators to determine the latest permit status and other regulatory information.

Properly permitted treatment, storage, or disposal facilities that are currently accepting commercial mixed waste should fill out the following form only if they wish to participate in this HomePage.

Index of Participating Mixed Waste Treatment, Storage, and Disposal Facilities (TSDF's)

Envirocare of Utah, Inc.

Envirocare provides treatment, storage, transportation and disposal for waste streams in excess of 100 cubic feet.

Envirocare accepts both remediation and process wastes.

Envirocare accepts all nuclides within specific limits (less than NRC Class A), and over 200 waste codes including characteristic and listed wastes.

Programs

Programs Home
WIPP Oversight
Yucca Mtn. Standards
Mixed Waste
Federal Guidance
Naturally Occurring Radioactive Materials
Radon
Radionuclides In Water
SunWise
Rad NESHAPs
Regional Programs
MARSSIM
MARLAP
Cleanup: Technologies & Tools
Risk Assessment
Radiological Emergency Response
Clean Materials
Laboratories

Envirocare's treatment operation performs two types of mixed waste treatment:

1. Stabilization - State-of-the-art 150 tons per day treatment facility can process soils, sludges (up to 49% aqueous liquids), debris, process wastes, etc. to meet either characteristic or listed treatment standards. Non-thermal technologies include stabilization, chemical fixation, chemical oxidation, chemical reduction, neutralization, deactivation. Less than 5% volume of increase is typical.
2. Macroencapsulation - LDPE extrusion technology encapsulates elemental lead and debris in order to meet both D008 and alternative debris treatment standards.

The Envirocare facility is located in the Great Basin Desert Area of western Utah, approximately 75 miles west of Salt Lake City. This arid location receives less than 6 inches of yearly precipitation, and is 40 miles from the nearest populated area. In 1988, Envircare began NORM disposal operations at the site. In 1992, capabilities expanded to include LLRW and mixed waste disposal. Full scale mixed waste treatment operations began in early 1995. Currently, Envirocare is the only permitted solid mixed waste disposal facility in the U.S. The mixed waste cells exceed EPA requirements for design and construction for hazardous waste disposal. These cells are above-grade, capped embankments designed for lifetimes of at least 1,000 years.

The State of Utah is both an NRC Agreement state and an EPA RCRA Authorized state, and therefore Envirocare's primary license and permit are state regulated.

Envirocare holds the following permits:

- Utah Division of Radiation Control
  Radioactive Material License
  License Number - UT 2300249
- Utah Division of Solid and Hazardous Waste
  RCRA Part B Permit
  EPA ID# - UTD982598898

more info

Business Development Group
Envirocare of Utah, Inc.
46 W. Broadway, Suite 240
Salt Lake City, UT 84101
Phone: (801) 532-1330
Fax: (801) 537-7345

E-
mail: bd1@isp.homestar.net

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Diversified Scientific Services, Inc. (DSSI)
(A Wholly Owned Subsidiary of Perma-Fix Environmental Services, Inc.)

DSSI provides thermal treatment of LIQUID mixed, hazardous and/or radioactive waste. DSSI also provides for waste brokerage and transportation services.

DSSI accepts remedial and as-generated process wastes provided that the waste is a pumpable liquid and one that DSSI can accept (see below).

In LIQUID form, DSSI can accept all RCRA hazardous waste codes (except F020, F021, F022, F023, F026, and F027), including waste containing small quantities of radioisotopes with atomic numbers 1 through 83 (inclusive), and multiple isotopes from atomic numbers 88 through 96.

DSSI owns and operates an industrial boiler system that produces electrical power from the thermal treatment of liquid wastes classified as mixed or radioactive. The residue resulting from the treatment process is considered DSSI generated waste, and is disposed of by DSSI at an appropriately licensed and permitted disposal facility. Through beneficial recovery of thermal energy, large quantities of mixed waste that would otherwise be stored produce a useful product while a substantial waste reduction is accomplished.

The following is a short history of DSSI.

1989 Permitted by Private Investors
1991 Purchased by Chemical Waste Management, Inc.
1992 Operated by Chem-Nuclear Systems, Inc.
1992-93 Facility and System Upgrades
1993 Operations Resumed in December of 1993
1995 Final Facility Upgrades completed
2000 Permit renewal
2000 Purchased by Perma-Fix Environmental Services, Inc. (PESI)

DSSI holds the following permits:

1. EPA Generators Number: TND98-210-9142, Issued by: State of Tennessee Department of Environment and

Conservation Division of Solid Waste Management
2. TSD Part B - Hazardous Waste Permit:TNHW-024, Issued by: State of Tennessee Department of Environment and Conservation Division of Solid Waste Management
3. Radioactive Materials License: R-73014-K98, Issued by: State of Tennessee Department of Environment and Conservation Division of Radiological Health
4. Air Pollution Permit: 937185F, Issued by: State of Tennessee Department of Environment and Conservation Division of Air Pollution Control
5. NPDES Storm Water Runoff: TNR00321, Issued by: State of Tennessee Department of Environment and Conservation Division of Water Pollution Control
6. NESHAP (No number specified), Issued by: U.S. EPA, Region IV
7. Boiler & Industrial Furnace (BIF) Part B Permit Part A: TND98-210-9142, Issued by: U.S. EPA, Region IV

657 Gallaher Road
Kingston, Tennessee
37763
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HomePage:
Diversified Scientific Services, Inc.
E-mail Address:
dssitn@dssi-tn.com

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NSSI

NSSI is a fully RCRA Part B permitted facility which accepts hazardous, mixed, and radioactive wastes for treatment, storage, and disposal.

NSSI has an authorized drum storage capacity of 4000 drums. NSSI is a permitted radioactive, mixed, and hazardous waste transporter. Disposal of all residues of wastes received at NSSI is at offsite facilities. A list of authorized treatments at NSSI is contained in the permits. Copies of the permits are contained in the facility profile.

NSSI accepts both remediation and as-generated process wastes. NSSI accepts private sector wastes only, DOE, DoD, and other government generated wastes are accepted only through private sector brokers.

NSSI is permitted for all EPA waste codes, all waste forms, and all radionuclides including special nuclear material. The only waste materials not currently acceptable at NSSI are PCB above 50 ppm, explosives, and Dioxins. NSSI is licensed for all radionuclides including special nuclear material.

NSSI was formed in 1971 primarily as a manufacturer of tracer materials and sealed sources for the oil well logging industry. Waste was a minor business until 1980 when EPA began to regulate wastes. Waste activities are now the primary business at NSSI. NSSI has accepted radioactive, hazardous, and mixed wastes since 1971, 1980, and 1981, respectively.

NSSI is licensed for radioactive waste treatment and storage under the Texas Bureau of Radiation Control (BRC) agreement state license Lo-1811. NSSI is permitted for the treatment and storage of hazardous and mixed wastes under Texas Natural Resources and Conservation Commission (TNRCC) permit number HW50269.

more info

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Perma-Fix Environmental Services, Inc.

Perma-Fix possesses a RCRA Part B permit to qualify as a TSDF (Treatment, Storage and Disposal Facility) to store and process hazardous and mixed wastes.

Perma-Fix possesses a Radioactive Materials License authorizing the receipt of Source, Special Nuclear, By-Product, Naturally Occurring and Accelerator-Produced Radioactive Materials.

The license and permit authorize the receipt of liquids, sludges and solids for the purpose of storage, treatment and disposal.

The facility uses state-of-the-art analytical and treatment equipment to:

- Decommission labpacks
- Thermally treat organic liquids, sludges and solids
- Stabilize mixed wastes containing inorganic compounds using the proprietary Perma-Fix Process
- Distill halogenated organic liquids

Perma-Fix provides a full scope of services for generators of hazardous, non-hazardous, mixed and radioactive wastes. Perma-Fix has the expertise to provide:

- Mixed waste treatment
- Liquid scintillation vial processing and disposal
- Decay-In-Storage of short-lived wastes
- Research and development of "orphaned" mixed wastes
- Laboratory analysis and waste characterization
- On-site decontamination and remediation
- Audits and training programs
- Radioactive materials licensing assistance

The Gainesville facility has been a mixed waste facility since 1983 that:

- Handles an estimated 80% of the liquid scintillation vial (LSV) waste processing for the country, and
- Receives mixed waste from all 50 states and the U.S. territories.

Ben Warren or Ray Whittle
1940 N.W. 67th Place
Gainesville, FL 32653
Phone: (800) 365-6066
Fax: (352) 372-8963
HomePage:
Permafix Environmental Services
E-mail:
corporate@perma-fix.com

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East Tennessee Materials and Energy Corporation (M&EC) (A Wholly Owned Subsidiary of Perma-Fix Environmental Services, Inc.)

The Waste Treatment Center is located at the

East Tennessee Technology Park (ETTP) within the USDOE complex (formally the K-25 site) near Oak Ridge, Tennessee.

M&EC possesses a RCRA Part B permit to store and treat mixed wastes. This qualifies as a TSDF (Treatment, Storage and Disposal Facility).

M&EC possesses a Radioactive Materials License authorizing the receipt of Source, Special Nuclear, By-Product, Naturally-Occurring and Accelerator Produced Radioactive Materials.

The license and permit authorize the receipt of liquids, sludges and solids for the purpose of storage, treatment and disposal. Processes are focused on employing safe and controlled methods of treatment in large batches that are tailored to the specific wastes to be treated.

With state-of-the-art treatment equipment, the facility:

- Uses the pre-treatment process for the separation of organics from the solids;
- Uses chemical extraction employing several techniques to destroy the organic portion of the wastes;
- Uses aqueous waste treatment to include: equalization, neutralization, precipitation, filtration, ion exchange, and activated carbon adsorption to treat these wastes;
- Uses dewatering and filtration system employing a filter press to dewater sludges which result from the aqueous water treatment processes;
- Uses chemical fixation for solid and sludge wastes that contain RCRA hazardous metals. A chemical fixation agent is added to the waste which reacts to produce a metal complex that is no longer characteristically hazardous; the waste can then be tested and confirmed as passing the test; then solidified;
- Uses a metals precipitation process by chemically precipitating metals into a low solubility form prior to final treatment; and
- Uses other waste treatment processes to include neutralization, alkaline chlorination, controlled waster reaction and liquefaction.

M&EC provides a full scope of services for generators of mixed wastes predominantly oriented to large volumes of mixed wastes from the USDOE.

M&EC has the contracts to receive and treat wastes from the Department of Energy and its

Prime Contractors through the BROAD SPECTRUM contract issued by Bechtel Jacobs, LLC. The USDOE and its contractors are able to ship wastes to the M&EC facility with established contractual and pricing methods in place.

2010 Hwy 58, Suite 2010,
Blkd. K-1005
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Treatment Options • Mixed Waste Treatment Guidance • TSDF Information Form

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Last updated on Tuesday, December 3rd, 2002
URL: http://www.epa.gov/radiation/mixed-waste/mw_pg11a.htm